TEST TITLE:MAIN.NET PLC.INC
DATA FILE :332_N.D30
Amplitude Units : dBuV

Threshold -20 dB

PAGE 1
Freq.(MHz)
0.5350

Freq(MHz)	Amp	CARRIER.S30 vs Spec(dB)
1.6642	42.0	-18.000 *
1.6675	45.0	-15.000 *
1.6709	43.0	-17.000 *
1.6743	43.0	-17.000 *
1.6776	41.0	-19.000 *
1.6844	42.0	-18.000 *
1.6877	43.0	-17.000 *
1.6911	45.0	-15.000 *
1.6945	45.0	-15.000 *
1.6979	44.0	-16.000 *
1.7012	42.0	-18.000 *
1.7046	40.0	-20.000 *
1.7050	41.0	-19.000 *

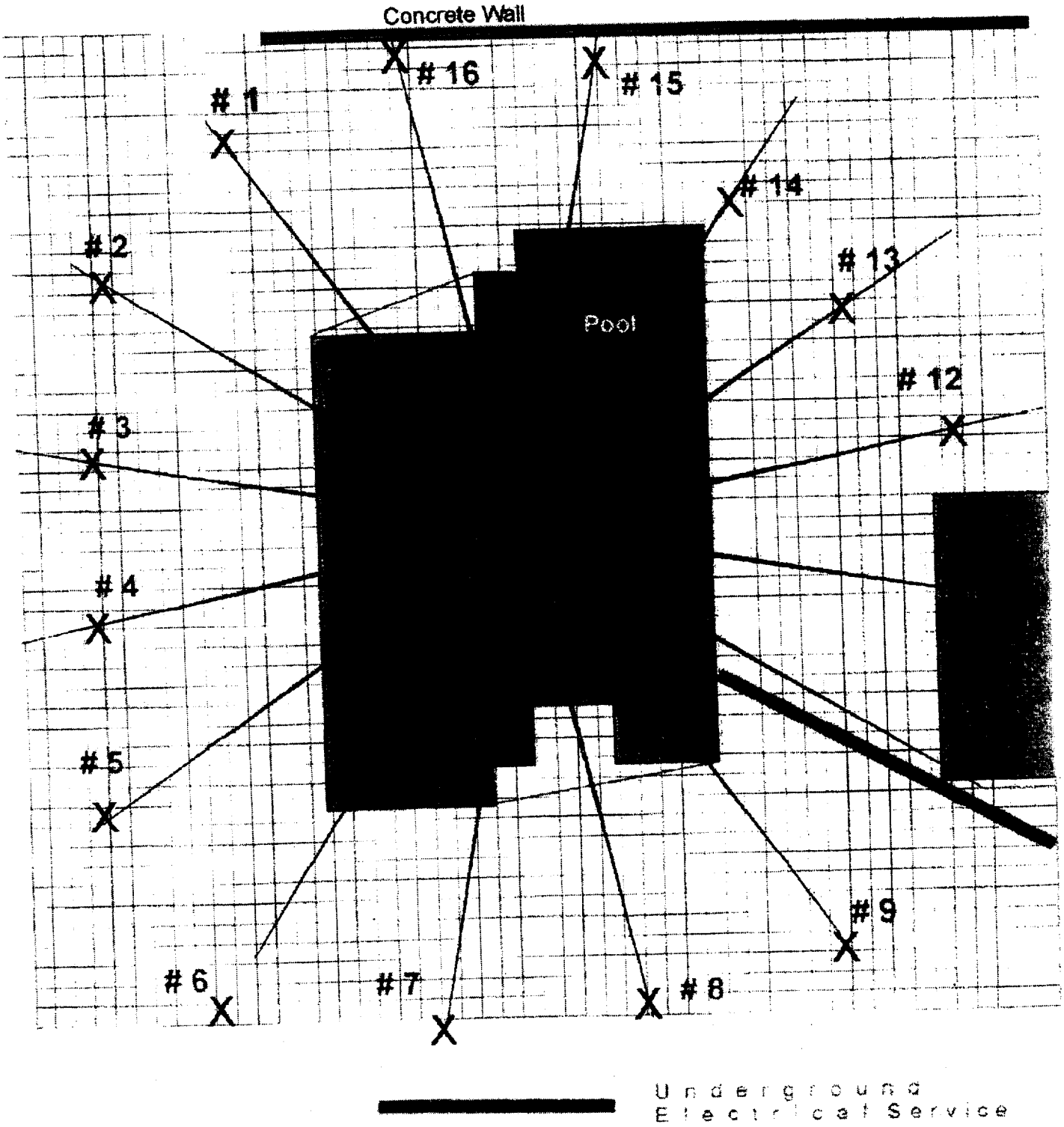
A10

Home Photos & Layouts

All

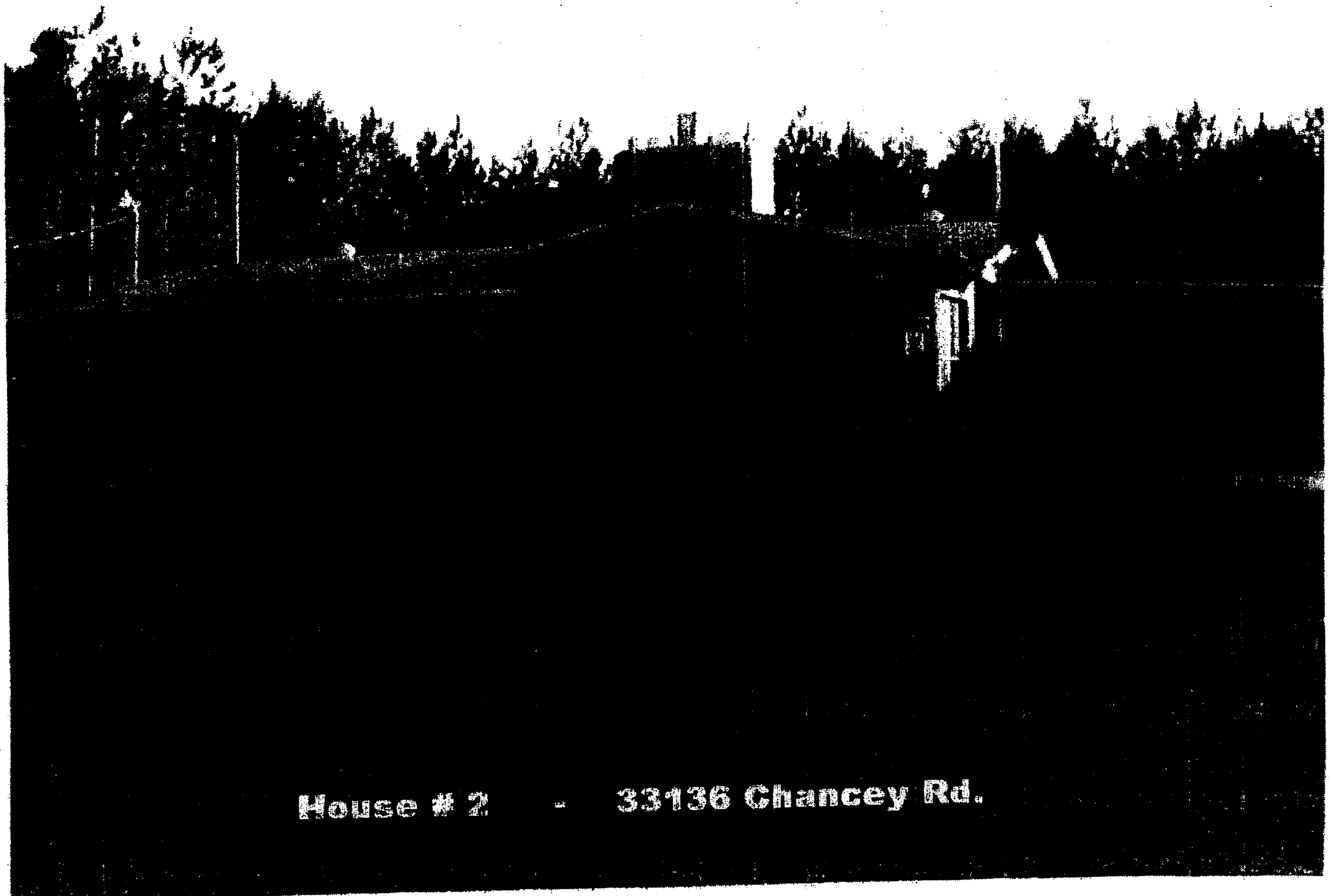

House # 1
1811 Tamerlane Place

House # 1 - 1811 Tamerlane Place



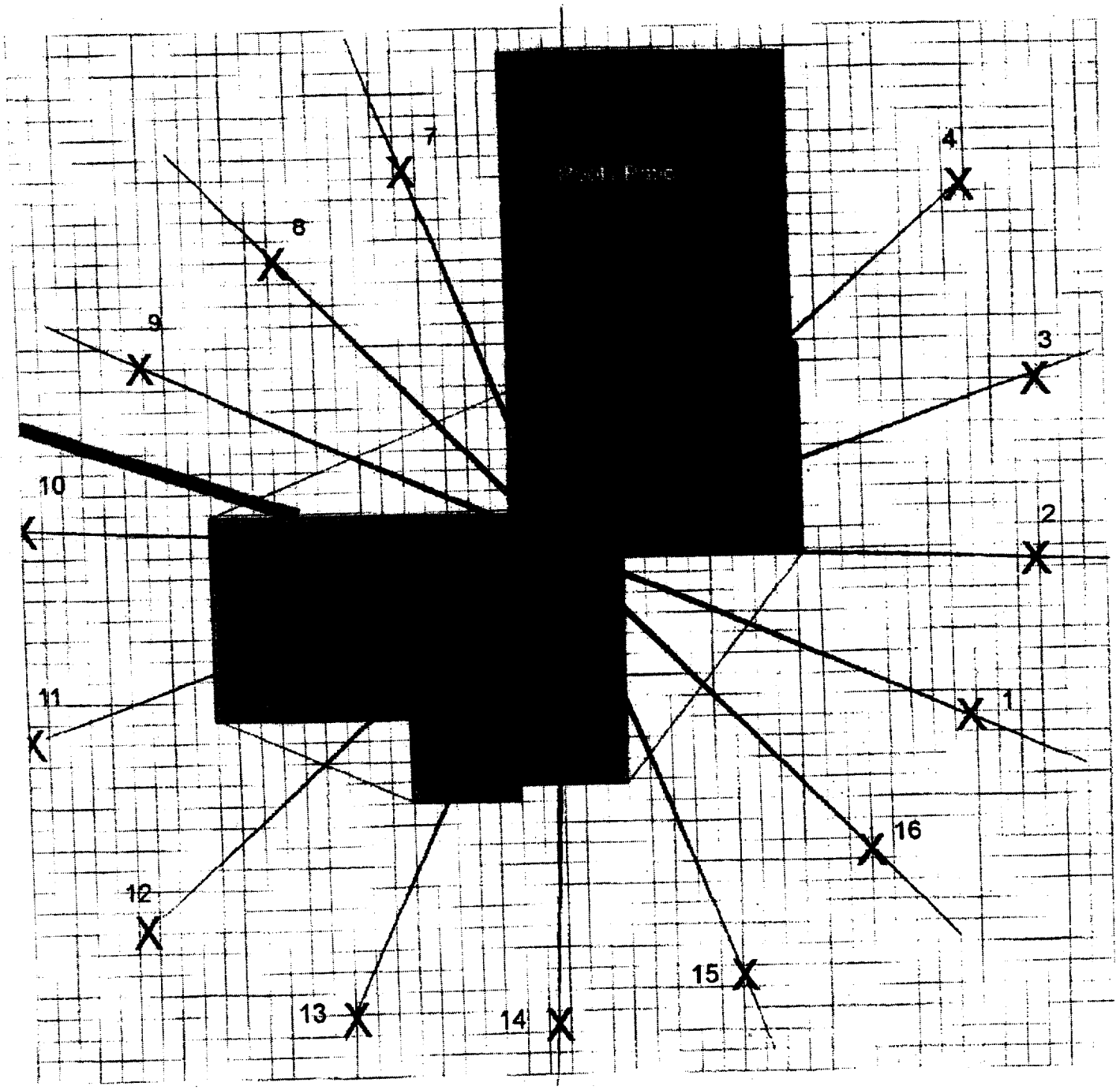
Scale - approx. 3' per square

A13



A14

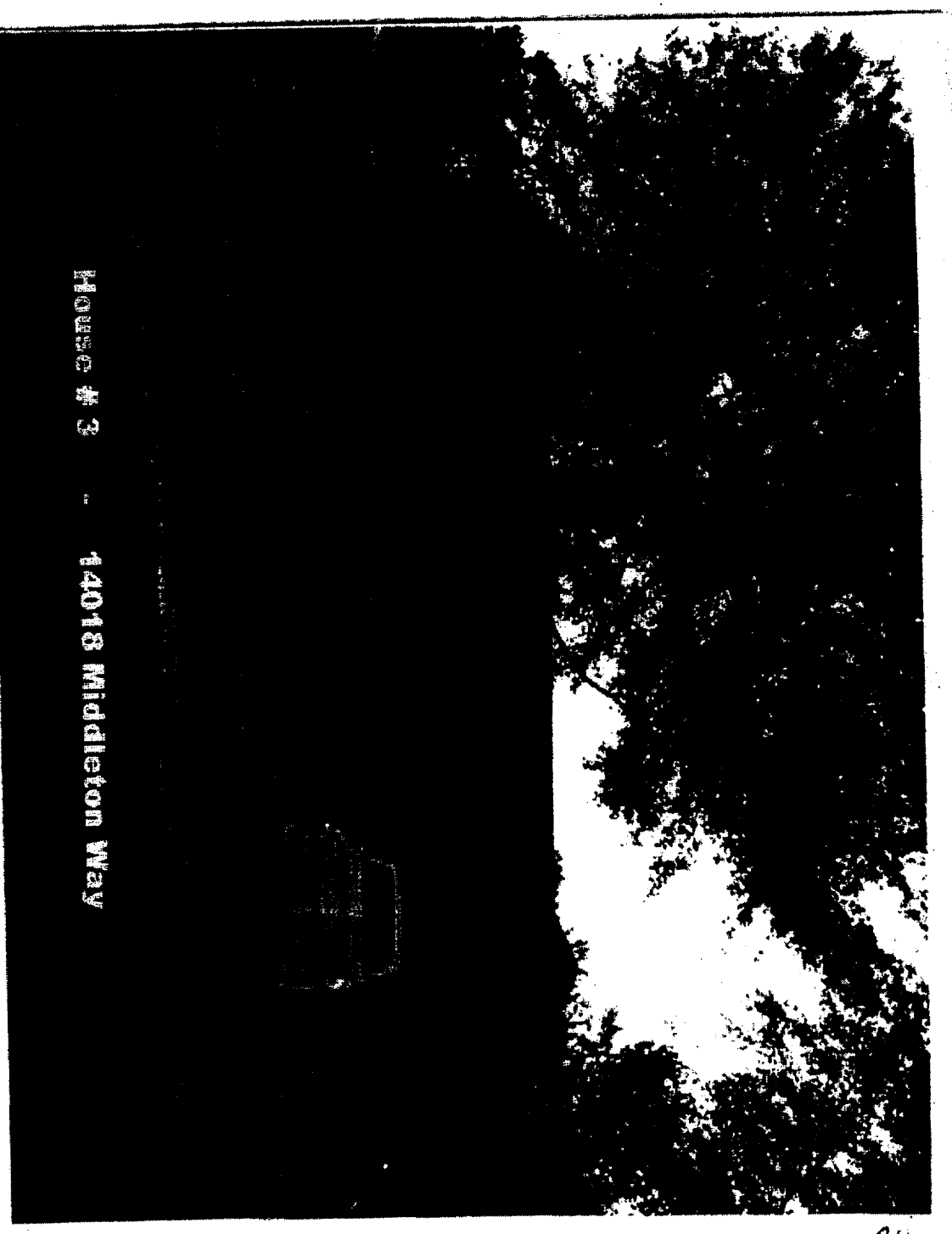
House # 2 - 33136 Chancey Rd



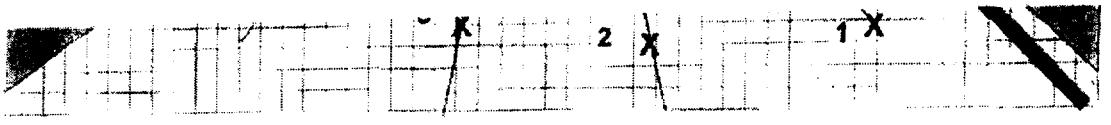
Aerial
Electrical Service

Scale - approx. 3' per square

A15



A16

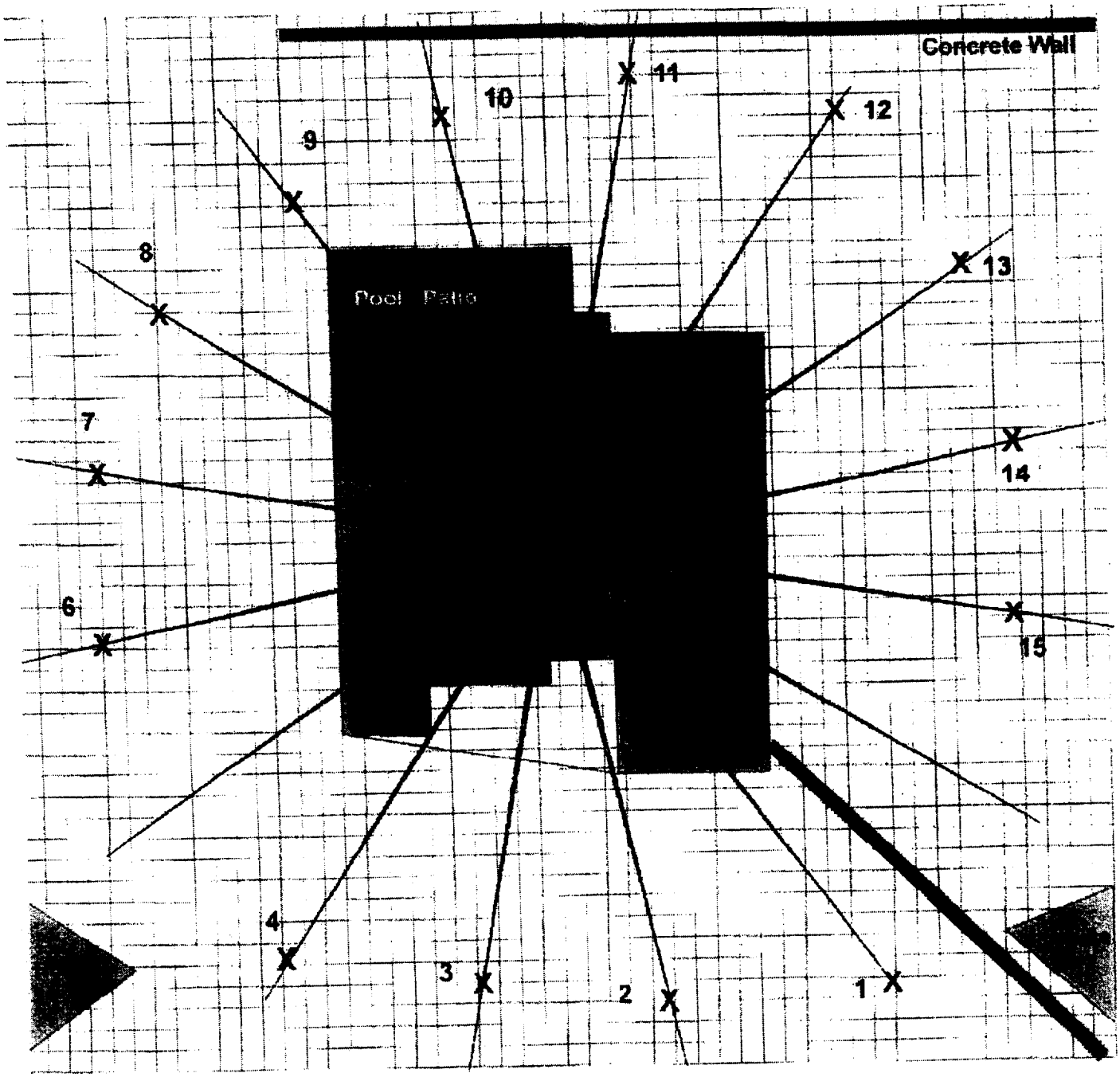


Underground
Electrical Service

Scale - approx. 3' per square

A17

House # 3 - 14018 Middleton Way



Underground
Electrical Service

Scale - approx. 3' per square

A17

APPENDIX

B

System Under Test Description

Product Safety Engineering, Inc 12955 Bellamy Brothers Blvd. Dade City, FL 33525
Tel (352) 588-2209 Fax (352) 588-2544

SYSTEM COMPONENTS

****

DEVICE TYPE: EUT, Main.Net PLC Inc. Model# NT Plus 3.0

****

DEVICE TYPE: Essenta Laptop Computer

****

DEVICE TYPE: Delta Power supply for Essenta Laptop Computer

****

DEVICE TYPE: E-machines Computer used as Auxillary equipment

****

INTERFACE CABLES

****

DEVICE TYPE: EUT Transmitter
SHIELD: No
LENGTH: 1 Meter Bundled
CONNECTOR TYPE: RJ-45 TO RJ-45
PORT: Ethernet to Laptop

****

DEVICE TYPE: EUT Receiver
SHIELD: No
LENGTH: 1 Meter Bundled
CONNECTOR TYPE: RJ-45 TO RJ-45
PORT: Ethernet to desktop E-Machine computer

****

AC LINE CORDS

****

DEVICE TYPE: Delta Power Supply
SHIELD: No
LENGTH: 1 METER
CONNECTOR TYPE: IEC TO DEDICATED

****

DEVICE TYPE: EUT
SHIELD: No
LENGTH: 1 METER
CONNECTOR TYPE: 2 CONDUCTOR AC Cord (No Earth)

****

BOOTH, FRERET, IMLAY & TEPPER, P.C.

COPY

ATTORNEYS AT LAW

ROBERT M. BOOTH, JR. (1911-1981)
JULIAN P. FRERET (1918-1999)
CHRISTOPHER D. IMLAY
CARY S. TEPPER

NIELS S. QUIST*
*ADMITTED IN NEW YORK

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BETHESDA, MD 20814-3628

TELEPHONE: (202) 686-9600
FACSIMILE: (202) 686-7797
BFITPC@AOL.COM

SILVER SPRING OFFICE:
14356 CAPE MAY ROAD
SILVER SPRING, MD 20904-6011

TELEPHONE: (301) 384-5525
FACSIMILE: (301) 384-6384

September 8, 2004

Via Courier and Email
David Solomon@fcc.gov
Bruce.Franca@fcc.gov

David Solomon, Chief
Enforcement Bureau
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Bruce Franca, Deputy Chief
Office of Engineering and Technology
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

RE: Experimental Station WC2XXK (File No. 0093-EX-PL-2002; Ameren Energy Communications Broadband Over Power Line System at Cape Girardeau, Missouri; Request for Immediate Cessation of Operation and Revocation of Experimental License

Gentlemen:

This office represents ARRL, the National Association for Amateur Radio, also known as the American Radio Relay League, Incorporated (ARRL). The purpose of this correspondence and the attached exhibit is to establish that on August 8th, 2004, measurements were taken at a BPL trial system located in Cape Girardeau, Missouri, more specifically on Belleridge Pike at its intersection with Melrose Avenue (the Cape Girardeau, Missouri BPL Trial system). The result of tests conducted by Metavox, an independent engineering firm in Dulles, Virginia retained by ARRL, were such that this site has unusually high levels of radiated emissions and is not compliant with FCC part 15 limits. Therefore, the Cape Girardeau, Missouri BPL system is in violation of the specific conditions of the granted experimental license. ARRL therefore requests that

this experimental license be immediately revoked; that the Cape Girardeau BPL system be instructed to shut down immediately; and that it not resume operation unless the facility is shown to be in compliance with Commission rules regarding radiated emissions. As support for theses requests, ARRL states as follows:

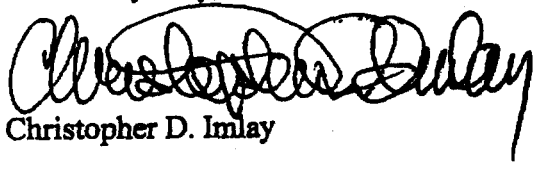
The experimental license, which expired June 1, 2004, is in the name of Ameren Energy Communications and specifies operation between 1.71 and 30 MHz. ARRL has conducted its own independent tests of the Cape Girardeau BPL system using tried and true scientific methods. Attached to this letter as Exhibit A is a report of field strength measurements taken by Metavox President Frank Gentges on August 8, 2004 on Belleridge Pike at its intersection with Melrose Avenue in Cape Girardeau. Mr. Gentges found strong BPL interference at this site, which was impulsive and was distinctive and clearly distinguishable from other users or 60 Hz power line noise. The measurement antenna was placed at a horizontal range of 30 meters horizontal distance from the medium voltage power conductors.

According to the study, the site had unusually high levels of radiated RF and is not compliant with FCC Part 15 limits. The signal structure is consistent with signals observed at other BPL locations. The measured interference levels exceeded the FCC Part 15 limits by as much as 16.6 dB at the FCC specified 30-meter distance. From these measurements taken by Metavox, it is apparent that the radiated emissions from the BPL modems at the test sites are well in excess of what the Commission's regulations permit.

ARRL notes that the standard for exceeding power limits is $4,000. The terms of the experimental license has been violated in any case, and it must be revoked immediately and the test site shut down. ARRL requests that this test station be shut down immediately and that the appropriate monetary forfeitures be imposed against Ameren Energy Communications.

Kindly address all communications on this subject to the undersigned counsel.

Yours very truly,



Christopher D. Imlay

cc: James A. Strenger, Troutman Sanders LLP
Dan Cole, President, Ameren Energy Communication
(via U.S. Mail)

METAVOX INC.
45915 Maries Road
Suite 140
Dulles, VA 20166-9280
(703) 444-0511

Cape Girardeau, MO BPL Trial System Electromagnetic Emission Tests

Metavox, Inc.
August 8, 2004

INTRODUCTION

Metavox, Inc conducted electromagnetic emission testing of the Cape Girardeau, MO BPL trial system. This effort was an independent measurements of the radiated emissions from overhead power line systems distributing Broadband over Power Line (BPL) service to residential subscribers.

BPL systems use digital signal communications of wide bandwidth. The systems are known to occupy spectrum in the frequency region from 1.7 MHz to 30 MHz, with harmonic content into the VHF spectrum. Some of these trial systems operate under Part 5 experimental licenses to conduct testing over a range of 1.7 MHz to 80 MHz.

The purpose of the test conducted here is to measure the field strength of radiated emissions from the BPL system in order to provide a quantitative basis for assessing the potential for interference to licensed radio systems operating in the same frequency range. Most BPL systems seek to operate under limits established by the FCC for Part 15 devices as unlicensed, unintentional emitters. The testing conducted here will assist in efforts to compare the observed BPL emissions to the emission limits established by FCC pertaining to unlicensed devices Specifically, FCC in Part 15 currently "requires that unlicensed devices operating below 30 MHz comply with a quasi-peak radiated emission limit of 30 μV/m at a distance of 30 meters at all frequencies over the range from 1.705 to 30 MHz." This corresponds to 29.54 dB above one microvolt per meter which is the unit of field strength reported here.

On August 8th, 2004, measurements were taken at a BPL trial system located on Belleridge Pike at its intersection with Melrose Avenue. The results of the Metavox tests are tabulated in Appendix 2: Test Data, a description of the testing and test sites is described in the following sections.

APPROACH

Metavox outfitted a mobile van with calibrated emission-measuring equipment (see Appendix 3: Equipment). The mobility is used in the area of a BPL system to first locate specific positions where the BPL radiated emission is clearly detectable. A picture at the Cape Girardeau test site is shown in Figure 1. Figure 2 shows the electronics bench in the van interior with (from left to right on the bottom row of equipment) an HP 141T/8553L/8552A spectrum analyzer, a Tektronix 485 oscilloscope, and the Rohde & Schwarz ESH 2 test receiver. Above them is a Boonton 92A-S2 RF millivoltmeter and a Teac RD-111T PCM instrumentation recorder.

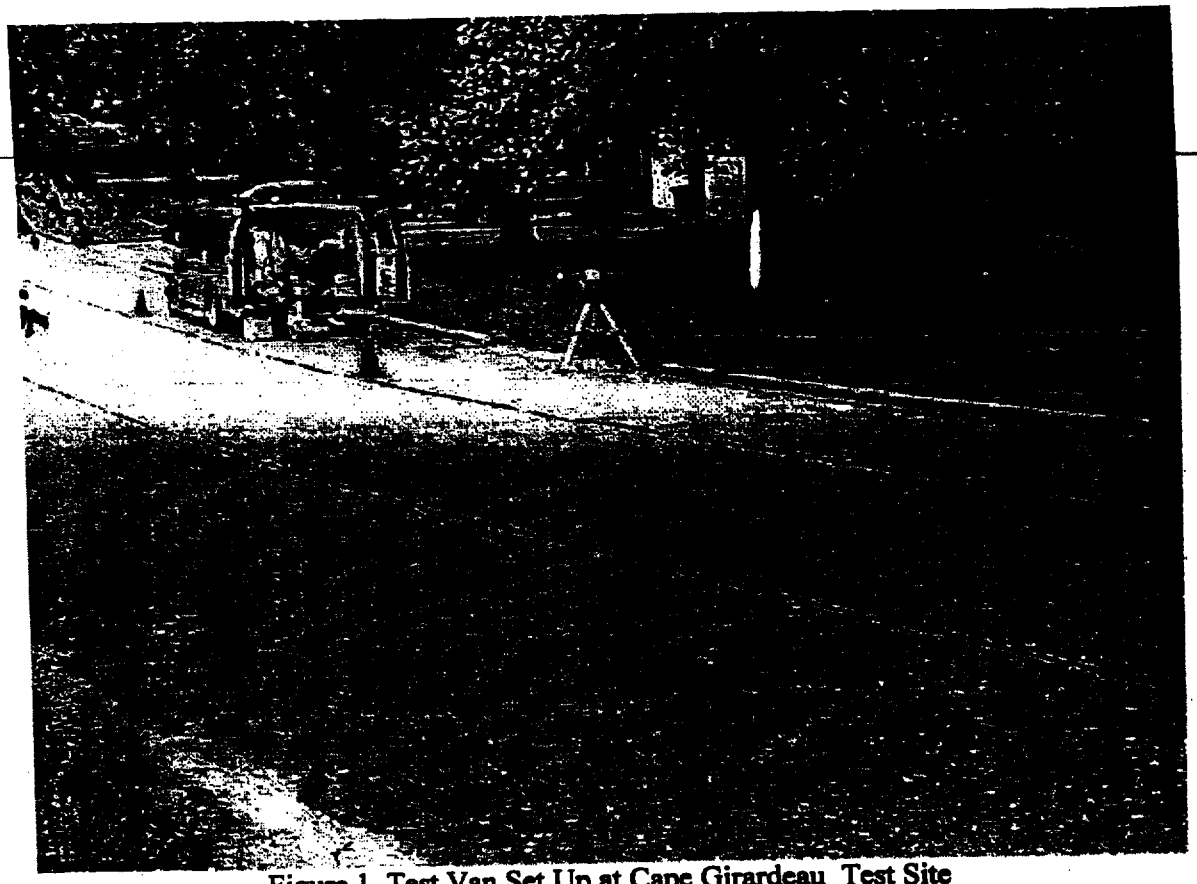
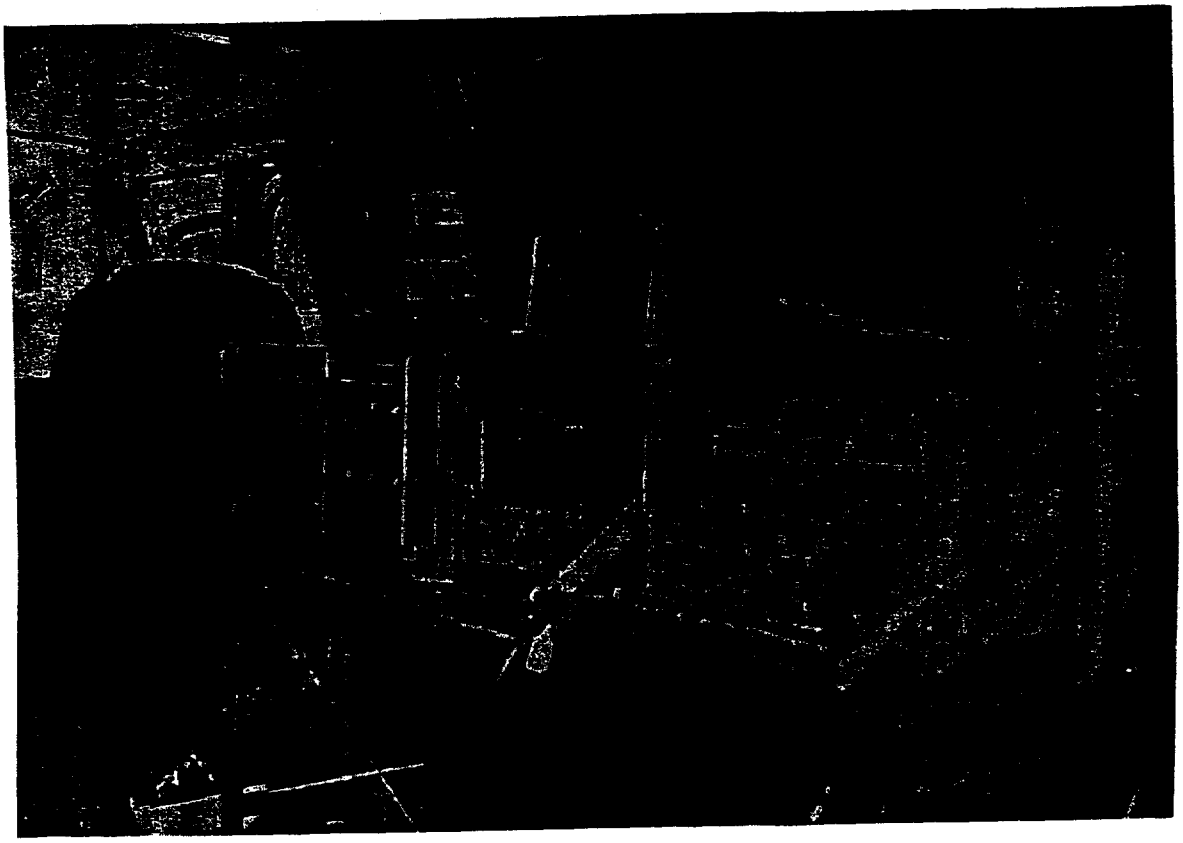


Figure 1 Test Van Set Up at Cape Girardeau Test Site



For signal level measurements, the ARA BBH-500/B active loop antenna is set out at about 5 to 10 meters from the vehicle as shown in Figure 1. The tripod positions the center of the loop at 1 meter above the ground. The full array of equipment is used in site selection to determine that the BPL signal is distinguishable and that the signal strength is adequately handled within the dynamic range of the instruments. However, in the test measurement process, only the active loop antenna, ARA model Model BBH-500/B and ESH 2 receiver are used for taking data. These instruments are calibrated to standards traceable to National Institute for Standards and Technology (NIST). Each field strength measurement is accurate within ± 1.5 dB since measurement accuracy is the combination of (uncorrelated) factors for the antenna (ARA model Model BBH-500/B) and the test receiver (Rohde & Schwarz ESH2) as given in the Appendix 2: Equipment.

Antenna placement and orientation was made considering all of the conductors of the surrounding power distribution system including the medium voltage power conductors, the secondary cable between transformers and the secondary cables to houses. A measurement of the output of the active loop is first made using a 300 MHz bandwidth Tektronix 485 oscilloscope to insure the active circuits are not overloaded by a strong signal. Measurements were then taken at three orthogonal orientations of the antenna for each frequency. Measurements were made using the receiver's CISPR mode. The CISPR measurement mode provides an objective measure of the effect of an interference on the reception of radio telephony.

Figure 3 Cape Girardeau Test Site Power Pole and Lines Including BPL Installation

TEST DESCRIPTION

Cape Girardeau-1

Testing was performed on a trial BPL system operating at Cape Girardeau, MO.. (see Appendix 1: Sites, Cape Girardeau-1) on August 8th, 2004. The detailed results are presented in Appendix 2: Test Data, Cape Girardeau-1 for a 30 meter horizontal distance from the power line.. The far right hand column is the RMS of the 3 field strength. This value bounds the worst possible level of interference by orientations. It may not determine non-compliance with FCC Part 15. The single axis measurements shown in bold type indicate non-compliance.

Figure 3 shows the overhead line on a pole along Melrose Avenue at the intersection with Belleridge Pike. This figure shows three-phase medium voltage lines running along Melrose Avenue. Telephone and fiber optic cables are below the medium voltage lines. The BPL interference at this site was impulsive and was distinctive and clearly distinguishable from other users or 60 Hz power line noise. The measurement antenna was placed at a horizontal range of 30 meters horizontal distance from the medium voltage power conductors.

CONCLUSIONS

This site had unusually high levels of interference and is not compliant with FCC Part 15 limits. The signal structure radiated is consistent with signals observed at other Main.Net sites.

The measured interference levels exceeded the FCC Part 15 limits by as much as 16.6 dB at the FCC specified 30 meter distance. It is possible that these levels could be reduced with system level adjustments and other system grooming to bring the system into conformance with the FCC limits.

Frank H. Gentges
President Metavox Inc.

R. A. Geesey, PhD
Technical Consultant

André V. Kesteloot
Life Senior Member, IEEE
Technical Consultant

B. E. Keiser, DScEE, PE
Project Consultant

Appendix 1: Sites

Cape Girardeau-1

The Cape Girardeau test site is along Melrose Avenue at the intersection with Belleridge Pike. A three- phase overhead medium voltage line runs along Melrose Avenue. This power line is where the BPL test system is installed. The neighborhood surrounding the test site is a fully developed community of single family homes and probably is at least 30 or more years old.

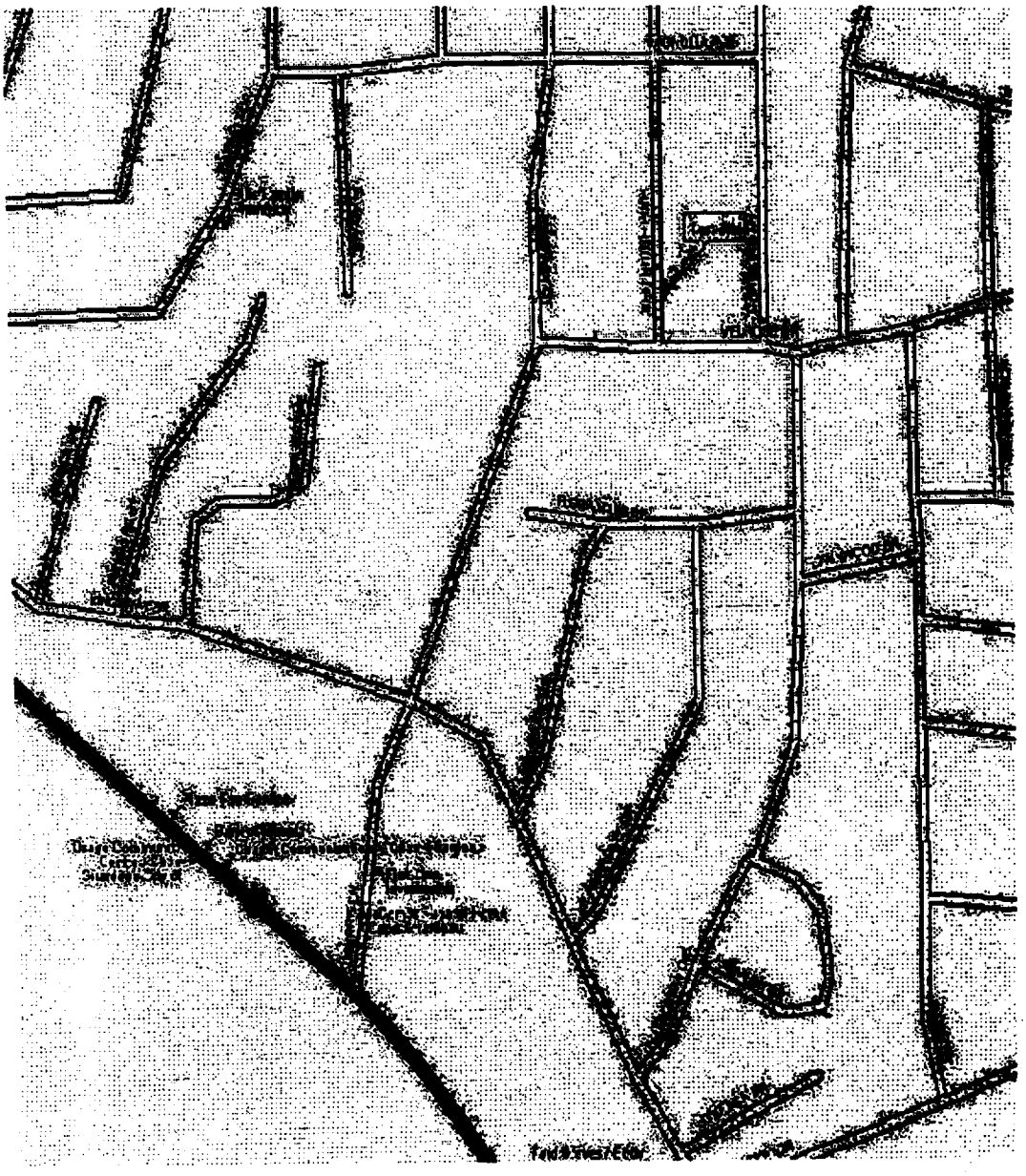


Figure 4 Cape Girardeau Test Site

Appendix 2: Test Data

Site: **Cape Girardeau-1**
August 8, 2004
Melrose Ave & Belleridge Pike
Cape Girardeau, MO

H-Probe Antenna: ARA Model BBH-500/B 1 meter high

			Receiver Indicated Strength						Field Strength			
	Cable	Antenna Factor (equiv. electrical, interpolated)	// to Line		⊥ to Line		Vertical		// to Line	⊥ to Line	Vertical	RMS (3-axis)
Freq	#1		Gain	dBµV	Gain	dBµV	Gain	dBµV	dBµV/m	dBµV/m	dBµV/m	dBµV/m
MHz	dB loss	dB1/meter	base+meter		base+meter		base+meter					
3.50	1.2	-6.00	20	13.0	20	16.0	'	'	28.2 i	31.2 i		
3.60	1.2	-6.00	20	11.0	20	15.0	'	'	28.2 i	30.2 i		
3.70	1.2	-6.10	20	14.0	30	12.0	'	'	26.1 i	37.1 i		
3.80	1.2	-6.10	20	12.0	30	9.0	'	'	29.1 i	34.1 i		
4.00	1.2	-6.10	20	16.0	30	14.0	'	'	31.1 i	39.1 i		
4.50	1.2	-6.50	30	14.0	30	12.0	'	'	38.7 i	36.7 i		
4.99	1.2	-6.80	30	10.0	20	13.0	'	'	34.4 i	27.4 i		
5.50	1.2	-6.87	30	10.0	20	13.0	'	'	34.3 i	27.3 i		
6.00	1.2	-6.87	30	12.0	20	12.0	10	9.0	36.3 i	26.3 i	13.3 i	36.8
6.50	1.4	-6.87	30	11.0	20	15.0	10	12.0	35.6 i	29.6 i	16.6 i	36.6
7.00	1.5	-6.87	30	14.0	20	13.0	'	'	38.6 i	27.6 i	-5.4 i	39.0
7.10	1.5	-6.87	30	9.0	20	8.0	'	'	33.6 i	22.6 i	-5.4 i	34.0
7.20	1.5	-6.87	30	10.0	20	10.0	'	'	34.6 i	24.6 i	-5.4 i	35.0
7.30	1.5	-6.87	30	9.0	20	7.0	'	'	33.6 i	21.6 i	-5.4 i	33.9
8.01	1.8	-6.87	40	10.0	20	12.0	20	9.0	44.9 i	26.9 i	23.9 i	45.0
9.14	1.6	-6.87	30	16.0	20	16.0	20	9.0	40.7 i	30.7 i	23.7 i	41.2
9.69	1.5	-6.87	30	13.0	20	16.0	20	8.0	37.6 i	30.6 i	22.6 i	38.5
10.15	1.4	-6.87	30	16.0	30	9.0	20	8.0	40.5 i	33.5 i	22.5 i	41.4
10.20	1.4	-6.87	30	15.0	30	8.0	20	9.0	39.5 i	32.5 i	23.5 i	40.4
10.89	1.6	-6.60	30	17.0	30	14.0	20	10.0	42.0 i	39.0 i	25.0 i	43.8
11.61	1.7	-6.20	30	16.0	30	14.0	20	5.0	41.5 i	39.5 i	20.5 i	43.6
12.25	1.8	-6.10	40	11.0	40	8.0	20	7.0	46.7 i	43.7 i	22.7 i	48.5
14.00	2.0	-5.57	30	12.0	30	12.0	20	7.0	38.4 i	38.4 i	23.4 i	41.5
14.10	2.0	-5.50	30	10.0	30	8.0	20	9.0	36.5 i	34.5 i	25.5 i	38.8
14.20	2.0	-5.50	30	11.0	30	11.0	20	7.0	37.5 i	37.5 i	23.5 i	40.6
14.35	2.0	-5.46	30	10.0	30	10.0	20	4.0	36.5 i	36.5 i	20.5 i	39.6
15.75	2.1	-5.01	30	15.0	20	14.0	10	12.0	42.1 i	31.1 i	19.1 i	42.4
18.10	2.2	-4.10	30	14.0	30	12.0	10	16.0	42.1 i	40.1 i	24.1 i	44.3
18.20	2.2	-4.10	30	14.0	30	15.0	20	8.0	42.1 i	43.1 i	26.1 i	45.7
18.30	2.2	-4.10	30	18.0	30	16.0	20	10.0	46.1 i	44.1 i	28.1 i	48.3
18.40	2.2	-4.00	30	17.0	30	14.0	20	11.0	45.2 i	42.2 i	29.2 i	47.8
21.00	2.2	-3.10	30	13.0	30	10.0	20	14.0	42.1 i	39.1 i	33.1 i	44.2
21.10	2.2	-3.10	30	13.0	30	11.0	20	10.0	42.1 i	40.1 i	29.1 i	44.4
21.20	2.2	-3.10	30	12.0	30	10.0	20	11.0	41.1 i	39.1 i	30.1 i	43.4
21.30	2.2	-3.00	30	10.0	30	5.0	20	9.0	39.2 i	34.2 i	28.2 i	40.6
21.40	2.2	-3.00	30	11.0	30	5.0	20	10.0	40.2 i	34.2 i	29.2 i	41.4

Site Monitor: antenna output
scope (peak-peak)
200mv

Notes:
i:BPL Impulses
Bold indicates BPL signal field strengths exceed FCC limits

Appendix 3: Equipment

Metavox tests used equipment calibrated to standards traceable to National Institute for Standards and Technology (NIST):

- Amplified magnetic-field antenna
- Receiver capable of tuning the HF band, with quasi-peak detection matching CISPR specifications.

Amplified H-Field Antenna: ARA Technologies, Inc., Model BBH-500/B, Serial Number 311

Reference: "Data Book, Magnetic Field Antennas, BBH-500/B", page 42; Antenna Research Associates, Inc, Beltsville, Maryland, 20705

> *The BBH series of broadband magnetic field (H field) receiving antennas are designed to provide maximum sensitivity for receiving magnetic field signals in the VLF, 100 Hz, through VHF, 100MHz, spectrum. These antennas are responsive primarily to the magnetic component of an electromagnetic field with practically no sensitivity to the electric component. The electrical balance with respect to ground and cable renders them almost immune to common mode interference. They exhibit remarkably clean reception in environments of locally generated man-made noise.*
>
> *The far-field receiving pattern is that of an elementary dipole with nulls of approximately –20 dB occurring off the ends of the rod. Integral active networks ensure the highest possible sensitivity. The BBH antennas yield much greater accuracy in measuring the tangential field of a source at close range than is possible with typical air core loops.*
>
> *An internal power supply and rechargeable batteries in these antennas minimize disturbances and permit operation under practically any condition.*

Magnetic field strength indication from the H-field antenna device is converted to electric field strength by the free space impedance with the common value of 377Ω:

$$af^{electric}_{(dB/m)} = af^{magnetic}_{(dB/m)} + 51.35_{dB\Omega}$$

The noise floor of the H-field antenna using the manufacturer's specifications, and scaled to the CISPR bandwidth of 9kHz, (i.e. 9.54 dB relative to 1kHz) is:

Frequency, MHz:	1	3	10	30
Noise Floor Field Strength, $dB_{\mu V/m}$:	34.9	5.9	2.9	10.9

Calibration: The Antenna Research Associates Model BBH-500/B, Serial Number 311, was calibrated by Liberty Laboratories Inc., 1346 Yellowwood Road, Kimberton, IA 51543, on Thursday, February 19, 2004, with Certification number: 2004021814 issued to Metavox, Inc.

Traceability: Certificates of Liberty Laboratories state that:

> *All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. Measurement procedures per Military Handbook 52A as guidance for Military Standard (MIL-STD) 45662A, ANSI/NCSL Z540-1-1994, ISO/IEC 17025 and Liberty Labs,Inc. procedure OP-2.*

Accuracy: The electrical equivalent antenna factor $af^{electric}_{BBH\ (dB/m)}$ is accurate within 0.9 dB for the frequency range from 1 to 30 MHz and certified by the calibration.

Receiver: Rohde and Schwarz Model ESH2, Serial Number 831436/006

Reference: "Data Sheet, Test Receiver ESH 2", Rohde & Schwarz, Republic of Germany.

The Test Receiver ESH 2 is a manually operated, highly sensitive and overload-protected test receiver offering a very wide dynamic range. Compact design, the wide range of power supplies that can be used, and low power consumption make the receiver suitable for use in fixed stations as well as for mobile and portable applications, such as field-strength measurements.

The ESH 2 can tune from 9kHz to 30MHz and operates as a selective voltmeter in a level range from –30 to +137 $dB_{\mu V}$ in 50 Ω systems. Overload of the input or of other important circuits is detected and signaled by the test receiver.

Selection of "CISPR quasi-peak weighted" detection provides an IF bandwidth (-6 dB) for measurements according to CISPR Publications 1 and 3 with 9kHz bandwidth for the HF frequency range.

Calibration: The Rohde & Schwarz Model ESH2, Serial Number 831436/006, was calibrated by Industrial Process Measurement, Inc, Edison, NJ,08820, on February, 5, 2004, with Certificate number 23725-01.

Accuracy: The frequency accuracy in the range of 1-30 MHz is +/- 0.00050 MHz.

The frequency response over the 0.01-30 MHz range, at a signal level of 80.0 $dB_{\mu V}$, is accurate to +/- 1 $dB_{\mu V}$ and certified by the calibration.

Report of Harmful Interference From a Broadband Over Power Line Trial or Deployment

Name of complainant: Donald W. Blasdell

Call sign (if applicable): W4HIL

Station location: 9727 Lewdoun Ave., Manassas, VA 20109

Mailing address (if different): _____

City, State, Zip: _____

Telephone: 703-369-2877 Email: W4HIL @ AOL.com

Description of Interference: Noise on Mobile QSO - ECARS - (Recorded)

Description of station: Mobile Station - Signal Hill Road + Nitony Drive - Manassas, VA

Receiver(s) affected: Icom 706 MKH G

Antenna type: Mobile "Bandhelper" Antenna (Screwdriver)

Antenna location: on Mobile "Tundra"

Distance of antenna from own house (feet): n/a

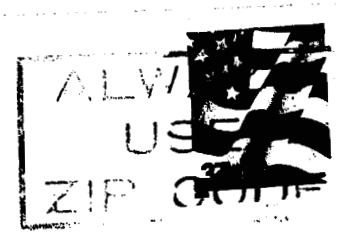
Distance of antenna from neighboring houses (feet): n/a

Distance of antenna from power distribution line or equipment (feet): 2 blocks (200 ft.)

Log of interference:

Date	Time	Frequency	Receive Mode	Interfering signal strength	Description
3/17/03	12:50 pm	7255	SSB	+20-40 DB over S9	Sounded like "pulses"

D.W. BLASDELL
9727 LOUDOUN AVE.
MANASSAS, VA 20109



RECV'D & INSPECTED

MAR 2 4 2004

FCC-OSC MAILROOM

FEDERAL COMMUNICATIONS COMMISSION
JAMES R. BURTLE
CHIEF, EXPERIMENTAL LICENSING BRANCH
GETTYSBURG, PA 17325

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April 15, 2004

James R. Burtle
Chief, Experimental Licensing Branch
Federal Communications Commission
Gettysburg, PA 17325

Dear Mr. Burtle:

Thank you for forwarding to the City letters from Ms. Ruth Frock, President, Ole Virginia Hams (OVH) Amateur Radio Club Inc. and from Amateur Radio Operator, Mr. George V. Tarnovsky, who is also a member of the OVH Club. Both letters expressed their concerns regarding possible radio interference caused by Broadband over Power Line (BPL) deployment in Manassas.

Before responding to their concerns, let me first describe the deployment of BPL in the City of Manassas. In October, 2001, The City of Manassas was awarded a grant by the American Public Power Association (APPA) for initiation of a pilot project to evaluate the delivery of high speed internet service through the City's existing electric distribution system. During this project, the City utilized the existing fiber optic network and newly developed Broadband over Power Line (BPL) equipment provided by Main.net communications, to construct a communications network. The network delivered high-speed internet access to residential and commercial participants of the pilot. During the project, participants enjoyed the ease and flexibility of high-speed internet access through a modem plugged into any electric outlet in their home. Throughout the project, participants made favorable statements regarding their use of this new technology. The speed, portability, ease of installation, and reliability were welcomed features of the system to project participants.

Through the success of the pilot project, the City demonstrated the advantages and feasibility of using BPL technology for the delivery of broadband services. Likewise, Manassas citizens indicated their desire to utilize a new technology for accessing the internet. The knowledge and experience gained from the pilot, as well as the successful customer experience of the pilot participants, compelled the City to push forward with a full-scale deployment of BPL.